Longitudinal Mediation Models of Coping, Spiritual Connection, Spiritual Meaning, Positive Affect and Distress in Cancer Survivors

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Abstract

Religiosity/spirituality is linked to better well-being. Spiritual Framework of Coping (SFC) model proposes paths to achieving emotional well-being, through spiritual connections/coping and meaning-making. To test SFC, four models were examined in 103 cancer patients, assessed at diagnosis, and again 12-/18-/24-/36- months post-diagnosis. Measures include religious and active-cognitive coping, religious attendance/importance, positive affect, spiritual meaning, and psychological distress (mood and depressive symptoms). Mediation was established by hierarchical multiple regressions and a Sobel test statistic. Positive affect served as a mediator between positive coping and spiritual meaning, and between spiritual connections and spiritual meaning. Spiritual meaning served as a mediator between positive affect and distress. Results support the SFC model, highlighting the importance of meaning and positive affect in adjusting to cancer.

Introduction

It is estimated that one in two men and one in three women will develop cancer sometime during their lifetime (American Cancer Society, 2007). Traditionally, a cancer diagnosis is a traumatic event that brings about emotional distress (Andersen, Anderson, & deProsse, 1989; Epping-Jordan et al., 1999; Maunsell, Brisson, & Deschenes, 1992). However, individuals have also reported positive experiences as a result of their cancer diagnosis, including positive meaning (Bower et al., 2005); increased self awareness and introspection (Carpenter, Brockopp, & Andrykowski, 1999); less negative affect and depression at follow-up (Carver & Antoni, 2004); and greater growth in relating to others, appreciation of life, and positive spiritual change (Cordova, Cunningham, Carlson, & Andrykowski, 2001).

Religion and spirituality has always been a large part of the human experience—about 95% of Americans believe in God or a higher power, a figure that has never dropped below 90% during the last 50 years (Gallup & Lindsay, 1999; Shorto, 1997). Religiosity/spirituality has been associated with a higher level of health functioning, both physically and psychologically (e.g. Koenig et al., 2004). Various aspects of religiosity/spirituality have been examined, such as religious coping, spiritual meaning, and religious attendance. Religious coping has been found to be associated with better physical and psychological well-being (Pargament, Koenig, & Perez, 2000; Pargament, Koenig, Tarakeshwar, & Hahn, 2004). Spiritual meaning has been found to be associated with a lower level of depression (Nelson, Rosenfeld, Breitbart, & Galietta, 2002). Religious attendance has been found to be associated with better mortality (Hummer, Rogers, Nam, & Ellison, 1999; Koenig et al., 1999). However, most of these studies that explore the relationship between religiosity/spirituality and health are cross-sectional, while few explore complex associations and mediation pathways (Gall et al., 2005).

Folkman and Lazarus theorize that coping is a response to manage one's perceived stress from external and internal demands and conflicts of the person-environment interaction, by a process of employing emotional, cognitive, and/or behavioral strategies, to reduce potential harmful psychological impact (Folkman & Lazarus, 1980, 1991; Folkman, Lazarus, Dunkel-Schetter, Gruen, & DeLongis, 1986; Lazarus, 1993). Pargament has specifically examined the concept of religious coping. Pargament (1997) suggested that an individual's general religious orientation increases one's frequency in religious coping, which ultimately leads to better outcome in major life events. Particularly in the face of stress, these general beliefs and practices translate into specific forms of religious coping. Based on the transactional model of stress and coping by Lazarus and Folkman (Folkman, 1997; Folkman & Greer, 2000; Lazarus & Folkman, 1984) and Pargament's research on religious coping (1997), the Spiritual Framework of Coping (SFC; Figure 1) attempts to conceptualize the relationship between spirituality, coping, and health (Gall et al., 2005) and provides a framework from which to examine the relationships of religiosity/spirituality and health.

Spiritual Framework of Coping

The SFC is a dynamic, process-oriented framework that allows spirituality to operate at several levels of stress and coping processes at a given time (Gall et al., 2005; Park & Folkman, 1997). According to the SFC model (Gall et al., 2005), a person faces a *stressor* and is oriented by his or her spiritual beliefs to cope. Coping skills are varied and can includes making primary and secondary *appraisals* (e.g. God attributions), reliance on *person factors* (e.g. beliefs), engaging in *religious/spiritual coping behavior* (e.g. prayer), finding *spiritual connections* through utilizing support resources (e.g. connection to nature or other people), and *meaning-making (*e.g. spiritual reappraisal). These various spiritual mechanisms of appraisal and coping

are mediating factors in the process of coping with stress. *Spiritual personal factors* are beliefs that orient the individual to the interpretation, understanding, and response to a life experience (Gall et al., 2005; see also Acklin, Brown, & Mauger, 1983; Dull & Skokan, 1995). Through *spiritual appraisal*, a person attempts to make sense of the stressor in the context of the individual's spiritual beliefs, by explaining the situation through an attribution to a causal origin, such as the will of God (Gall et al., 2005). By this *meaning-making* process, the initial level of stress is reduced enough for the person to engage in coping behavior (Davis, Nolen-Hoeksema, & Larson, 1998). The process by which the individual responds to either the stressor or related emotional reactions through specific behaviors is called spiritual coping (Gall et al., 2005). Consequently, the individual better deals with the stressful situation within the context of spirituality, which ultimately leads to a higher level of *well-being*.

Religiosity vs. Spirituality

One of the benefits of the SFC is that it is a broad framework that encompasses both constructs of religiosity and spirituality. While religiosity and spirituality traditionally have been synonymous, religiosity and spirituality have recently emerged as narrowly defined constructs that are distinct and polarized from each other (Zinnbauer et al., 1997). Religion is an external expression of faith or spirituality, comprising of beliefs, ethical codes and worship practices that unite an individual with a moral community (O'Rourke, 1997). Often, there is a specific set of institutionalized doctrines, ethics, rituals, texts, tradition and practices associated with religion (Helminiak, 2001). Religion is seen as primarily a social, institutional phenomenon compared to spirituality, which is better understood at the level of the individual (Miller & Thoresen, 2003; Thoresen, 1998). Spirituality can be conceptualized as one's interconnectedness to other people and sacred connection to a higher, transcendent reality that may not necessarily be a deity (Hill et

al., 2000; Peck, 1993). Spirituality often involves a search for meaning and purpose in one's life through transcendence beyond the biopsychosocial awareness of everyday experiences (Hill, et al., 2000; Thomas, 1997).

While religiosity is often associated with spirituality, a growing number of people are now meeting their spiritual needs outside of organized religious institutions (Zinnbauer et al., 1997; Zinnbauer, Pargament, & Scott, 1999), and spirituality may or may not include involvement in an organized religious institution (Miller and Martin, 1988). Consequently, a person may consider himself or herself very spiritual, but not at all religious (Roof, 1993; Koenig, George, & Titus, 2004; Zinnbauer et al., 1997); conversely, a person may consider himself or herself religious, but not spiritual (Koenig, et al., 2004; Zinnbauer et al., 1997).

Coping

In individuals facing life-threatening crises, religion is often cited more frequently than any other source as a resource for coping (Bulman & Wortman, 1977; Conway, 1985-1986), and is considered a particular asset in cancer (Hunt-Raleigh, 1992; Kaczorowski, 1989; Kune, Kune, & Watson., 1993; Reed, 1986; Tebbi, Mallon, Richards, & Bigler, 1987). Pargament, Smith, Koenig, and Perez (1998) dichotomized religious coping into two patterns: positive and negative. Positive religious coping includes religious forgiveness, seeking spiritual support, collaborative religious coping, spiritual connection, religious purification, and benevolent religious reappraisal. Negative religious coping includes spiritual discontent, punishing God reappraisals, interpersonal religious discontent, demonic reappraisals, and reappraisal of God's powers. Religious coping adds a unique dimension to health that contributes differently to health outcomes, in a way that is above and beyond nonreligious coping; consequently, religious coping

can never be reduced to nonreligious forms of coping because it impacts well-being differently (Pargament, 1997; Pargament et al., 1998).

However, the positive religious coping pattern does have similarities to nonreligious coping styles, specifically acceptance and positive reinterpretation. First, the acceptance style is a functional coping response where a person accepts the reality of a stressful situation in the attempt to deal with it (Carver, Scheier, & Weintraub, 1989). There are two coping processes implicated by acceptance: acceptance of the reality of the stressor occurs in primary appraisal while acceptance of the absence of active coping relates to secondary appraisal. This is similar to the spiritual appraisal level of coping in the SFC, which involves both primary and secondary appraisals. In a 2003 study, there was an association between utilizing spiritual resources and more positive general appraisals of illness and a more frequent use of coping for older adults (Gall, 2003a).

A second type of coping that has been linked to spiritual causal attribution is positive reinterpretation (Gall, 2003b; Miner & McKnight, 1999). Positive reinterpretation construes a stressful event in positive terms and allows the individual to continue or resume active, problem-focused coping actions (Carver et al., 1989). Both of these types of coping can combine into the general construct of an active-cognitive coping style, which is defined as an individual's acceptance of his or her illness, and attempting to view the illness in a positive and meaningful way (Fawzy et al., 1990). Higher levels of active-cognitive coping at breast cancer diagnosis predicted more meaning in life at 24 months follow-up (Jim, Richardson, Golden-Kreutz, & Andersen, 2006). Reliance on spiritual and religious beliefs and use of an active-cognitive coping style were positively correlated in a 117 sample of patients with melanoma, (Holland et al., 1999). Researchers suggested that these results show religiosity/spirituality to be related to

active, rather than passive, cognitive coping, and may aid the patients in finding meaning and perspective in the illness experience.

Spiritual Connection

Spiritual connection is identified as one of the coping resources for the SFC model. An individual may connect on a spiritual level with and through three identified entities: a transcendent being (God), nature, and other people (Gall et al., 2005). A proxy measure for spiritual connection with other people is religious association (i.e. religious affiliation and frequency and importance of church attendance). It provides for a common source of support (Koenig, Moberg, & Kvale, 1988) and is one of the two most frequently used support systems by cancer patients (Ginsburg, Quirt, Ginsburg, MacKillop, 1995).

Spiritual Meaning

In the SFC model, meaning-making is conceptualized as cognitive reappraisal that is crucial to successful adjustment to a situation that may be chronic or not easily ameliorated by coping methods (Park & Folkman, 1997). This meaning-making ability suggests that a person perceives his or her life as part of a larger picture (Jim et al., 2006; Paloutzian & Ellison, 1982; Yalom, 1980), and in stressful circumstances leads to success in coping, adaptation, and well-being (Emmons, 1999). A 1994 study on cancer patients found that spiritual interpretations of the experience aided the patients in reframing the experience to have positive consequences (Ersek & Ferrell). Conversely, the inability to make meaning promotes psychological distress, doubt, and uncertainty, which may contribute to inhibition of effective coping behaviors (Emmons, 1999; Krause, 1998). Jim and colleagues (2006) found that more frequent use of religious coping predicted a higher level of spiritual meaning. Research has also found that

higher spiritual meaning is negatively correlated with less emotional distress, as seen in a 2002 study with cancer and AIDS patients (Nelson, et al.).

Positive Affect

While the SFC model includes coping, spirituality, and distress as its primary constructs, other factors not included in the model may also play a mediating role to enhance comprehension of the complexity of the coping process. Positive affect is defined by the extent an individual experiences positive states such as joy, interest, confidence and alertness, and can be either a short-term state or a long-term trait (Fredrickson, 2001). As the field is relatively new, there is only a limited literature that specifically addresses positive affect in both the psychological and medical realms.

Positive affect, also referred to as positive emotions in the literature has been shown to be positively correlated with coping. Fredrickson formulates a theoretical model of positive affect called the broaden-and-build theory (1998): that certain discrete positive emotions—such as joy, interest, contentment, pride and love—while phenomenologically distinct, all share the ability to broaden an individual's momentary thought-action repertoires and build the individual's enduring personal resources, ranging from physical and intellectual resources to social and psychological resources. This process can buffer against harmful physiological effects of negative affect by the ability to bring to mind and express positive emotions (Danner, Snowdon, & Friesen, 2001; Fredrickson, 1998; Gable, Reis, Impett, & Asher, 2004; Harker & Keltner, 2001; Quartana, Laubmeier, & Zakowski, 2006; Zautra, Johnson & Davis, 2005). In a study where participants were shown films that induced various emotions, individuals who were shown the contentment or amusement film had faster recovery to baseline in cardiovascular reactivity than participants who viewed the sad or neutral film (Fredrickson & Levenson, 1998). Positive

affect also guards against deleterious physiological effects in the neuroendocrine system from a stressful event. Women had more adaptive hormonal responses to a laboratory stressor when they previously reported finding positive meaning in response to a traumatic event (Epel, McEwen, & Ickovics, 1998; McEwen, 1998). This indicates that the positive affect from the meaning-based coping may have made them more psychologically resilient and guarded them from maladaptive neural, endocrine, and immune responses to chronic stress that can lead to illness.

Positive affect is associated with lower levels of distress among cancer patients (Carver et al., 1993). This may be related to positive affect's relationship with coping. In a study of women with breast cancer, coping through emotional expression increased positive affect three months later (Stanton, Danoff-Burg, Cameron, Bishop, & Collins, 2000). Another study on patients with rheumatoid arthritis found a positive association between positive affect and adaptive coping styles (as defined by positive self statements and active coping; Zautra et al., 1995).

Positive affect is also associated with meaning. Folkman and Moskowitz identified the infusion of ordinary events with positive meaning as one type of coping that related to the occurrence and maintenance of positive affect (2000). In a study with 763 breast cancer survivors, the perceptions of positive meaning was associated with higher levels of positive affect and predicted modest increase in positive affect on an average of 2.8 years later after diagnosis among breast cancer survivors (Bower et al., 2005). More specific to the spiritual realm, research showed a positive association between the impact of spirituality on the ability to transcend challenges and attain goals, and positive affect (Kim, Seidlitz, Ro, Evinger, & Duberstein, 2004). In a study by Ramirez-Johnson, Fayard, Garberoglio, and Ramirez (2002),

breast cancer patients preferred positive emotion words over negative emotion words in defining how their religious faith helped them cope with cancer, suggesting that the meaning-making process of religious faith may be guided by emotions. The literature demonstrates the connection of positive affect to spiritual meaning in the coping process of the breast cancer experience.

Mediation

Unfortunately, the majority of investigations have not attempted to examine mediating factors between religiosity/spirituality and health, which may possibly be the most vital reason for examining the link (George, Ellison, & Larson, 2002). A mediator is a variable that explains the how or the why of the impact an independent variable has on an outcome variable (Baron & Kenny, 1986). Frederickson (2002) postulates that positive emotions may be the active ingredients between religiosity/spirituality and health and well-being, and that the ability to find positive meaning is the most reliable path to cultivating positive emotions (Folkman, 1997; Fredrickson, 2000; Ryff & Singer, 1998). Frederickson encourages exploration of a detailed causal model between religion and well-being, with positive meaning and positive emotions as mediators (2002). Such research will allow medical professionals to develop proper treatment strategies that will focus on improving these identified mediators.

Study Aim

The aim of this study is to examine longitudinal mediation models based on the Spiritual Framework of Coping. This study will contribute to a much-needed foundation of theory-based research to explain the religiosity/spirituality and cancer-related distress relationship, and provide a new paradigm that may effectively aid patients in approaching cancer treatment through their faith and positive emotional coping.

Hypotheses

Four general mediation models (See Figure 2) adapted from the Spiritual Framework of Coping will be examined. The first three models involved three independent variables: two forms of coping—religious coping and active-cognitive coping—and spiritual connection.

The first model investigated the basic model of the Spiritual Framework of Coping: that spiritual meaning was a mediator between coping/connection and distress (see Figure 2, Model 1). We hypothesized that a more frequent use of coping at 12 months post-diagnosis, either religious or active-cognitive, or spiritual connection at 12 months, would lead to less psychological distress at 36 months follow-up, through a mediating relationship of a higher level of spiritual meaning at 24 months follow-up.

The second model introduced positive affect as the mediator between coping/connection and distress. We hypothesized that a more frequent use of coping at 12 months follow-up, either religious or active-cognitive, or spiritual connection at 12 months, would lead to less psychological distress at 36 months follow-up, through a mediating relationship of a higher level of positive affect at 18 months follow-up (see Figure 2, Model 2).

The third model explored whether positive affect is a mediator between coping/connection and spiritual meaning. We hypothesized that a more frequent use of coping at 12 months follow-up, either religious or active-cognitive, or spiritual connection at 12 months, would lead to a higher level of spiritual meaning at 24 months follow-up, through a mediating relationship of a higher level of positive affect at 18 months follow-up (see Figure 2, Model 3).

The last model examined positive affect as the predictor, with spiritual meaning as the mediator between positive affect and distress. We hypothesized that a higher level of positive affect at 18 months follow-up would lead to less psychological distress at 36 months follow-up,

through a mediating relationship of a higher level of spiritual meaning at 24 months follow-up (see Figure 2, Model 4).

These propositions were not competing models, that is, if one model is statistically significant, it does not automatically render the other models false.

Methods

Design

The present study examined longitudinal mediation models of religious coping, active-cognitive coping, spiritual connection, positive affect, spiritual meaning, and distress in breast cancer survivors (see Figure 2). Coping, both religious and active-cognitive coping, was measured at 12 months follow-up. Spiritual connection was measured at 12 months follow-up. Positive affect was measured at 18 months follow-up. Spiritual meaning was measured at 24 months follow-up. Psychological distress was measured at 36 months follow-up.

Participants

The sample for the current study was drawn from a larger, randomized clinical trial testing the efficacy of a psychological intervention for patients with breast cancer ($N = 227$; Andersen et al., 2004). Women were accrued after surgical treatment for regional (Stage II or Stage III) breast cancer, but before starting adjuvant therapy. Exclusion criteria included younger than 20 or older than 85 years old, previous cancer diagnoses, refused cancer treatment, had begun or completed adjuvant treatment, or lived more than 90 miles from the research facility. Also, patients were ineligible if they have mental retardation, severe or untreated psychopathology (e.g. schizophrenia, bipolar disorder, etc.), neurological disorders, dementia, chronic fatigue syndrome, or any other immunologic conditions or diseases (e.g. rheumatoid arthritis).

Procedure

Breast cancer patients were approached by research staff in the outpatient breast cancer clinic during a post-surgical visit and informed consent was obtained. A female research assistant and nurse conducted all assessments in-person, either at The Ohio State University's General Clinical Research Center or the outpatient breast cancer clinic. Participants were paid $25 per assessment. Women (N = 227) were assessed and then randomized into intervention and assessment only study arms. The intervention was completed in twelve months. The results from the intervention have been published (Andersen et al., 1998; Andersen et al., 2004). The intervention was efficacious (Andersen et al., 2004). All patients were followed, and the data reported here are from women (N = 103) who remained disease-free and completed the initial and 12, 18, 24, and 36 months follow-ups. Of the 124 nonparticipants, 30 (24%) women had dropped out of the study, 36 (29%) had recurred or died, and 58 (47%) women remained in the study but missed at least one of the follow-up assessments

Predictor Measures

Religious and active-cognitive coping. Both religious coping and active-cognitive coping were assessed using the COPE-short form (Carver, 1997). The original COPE consists of 13 subscales (Carver, et al., 1989); the COPE-short form is a 30-item trait adaptation of the original COPE that assesses differential coping responses across time. The subscales include problem-focused strategies (e.g. active, planning), use of social support, turning to religion, substance use, as well as more problematic efforts (e.g. denial, disengagement). A factor analysis was conducted on the full sample of 227 women at the initial time point. Based on the factor analysis, two items make up the subscale for religious coping (e.g., "I am seeking God's help" and "I am praying or meditating more than usual"), and five items make up the subscale for

active-cognitive coping (combination of the acceptance and positive reinterpretation subscales; e.g., “I am learning to live with the fact that I have cancer” and “I am looking for something good in what is happening”). Items were rated on a 4-point Likert scale, with 0 = *not at all* and 3 = *often*, yielding a total possible range of score of 0 to 6 for religious coping and 0 to 15 for active-cognitive coping. Higher scores indicated a more frequent use of coping. The internal consistency for religious coping and active-cognitive coping were 0.739 and 0.674, respectively.

Spiritual connection. Spiritual connection is measured by a composite scale of religious attendance. Three items were combined from the Social Network Index (SNI; Berkman & Syme, 1979). The first is the religious affiliation item (i.e., "Do you belong to any organized religious group?"), which was scored as 0 = *no* or 1 = *yes*. The second is the frequency of religious service attendance (i.e., "How frequently do you attend church, synagogue or other type of religious services?"), which was scored on a 5-point Likert scale ranging from 0 = *never or almost never* to 4 = *more than once a week*. The third is the importance of religion or spirituality (i.e., "How important is religion or spirituality in your life?"), also was scored on a 5-point Likert scale, ranging from 0 = *not at all important* to 4 = *very important*. The composite index was constructed by summing the standardized scores of the three items, with a possible range of score between -10.2 to 10.2. Higher scores indicated a higher level of spiritual connection. The internal consistency for spiritual connection was .773.

Positive affect. Positive affect was assessed using the 8-item Vigor subscale of the 65-item Profile of Mood States (POMS; McNair, Lorr, & Droppleman., 1971). Participants rated the frequency of experiencing different emotions (e.g. “energetic” and “cheerful”) on a 5-point Likert scale, ranging from 0 = *not at all* to 4 = *extremely*. Overall score ranged from 0 to 32.

Higher scores indicated a higher level of positive affect. The internal consistency for positive affect was .942.

Spiritual meaning. Spiritual meaning was measured by the Meaning/Peace subscale of the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp; Peterman, Fitchett, Brady, Hernandez, & Cella, 2002). The FACIT-Sp is a 12-item scale designed to distinguish spirituality from religion in individuals with chronic or life-threatening illnesses. The Meaning/Peace subscale assesses existential issues related to purpose in life, harmony, and a sense of peace. For this subscale, eight items are summed (e.g., "I feel peaceful" and "I have a reason for living"), and were assessed by a 5-point Likert scale, ranging from 0 = *not at all* to 4 = *very much*. Overall score ranged from 0 to 32. Higher scores indicated a higher level of spiritual meaning. The internal consistency for spiritual meaning was .898.

Psychological distress. Psychological distress is examined by both the Total Mood Disturbance Score of the POMS (POMS TMD; McNair et al., 1971) and the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). 1.) POMS TMD is a 57-item self-report inventory regarding how the subject has felt in the past week. The TMD Score is the sum of the Tension, Depression, Anger, Fatigue, and Confusion subscales, not including the Vigor subscale. Subjects rated adjectives (e.g., “tense,” “angry,” and “unhappy”) on a 5-point Likert scale, ranging from 0 = *not at all* to 4 = *extremely*. The total score ranged from 0 to 200, with a higher score representing a greater mood disturbance. The internal consistency for POMS TMD at initial was .962 and at 36 months was .979. 2.) The CES-D Scale identifies current symptoms of depression (e.g., “I felt everything I did was an effort” or “I felt sad”) on a 3-point Likert scale, ranging from 0 = *hardly ever or never* to 2 = *much or most of the time*. Scores ranged from 0 to 22. Higher scores on both the POMS TMD and the CES-D indicated greater

psychological distress. The internal consistency for CES-D at initial was .739 and at 36 months was .870.

Analytic Strategy

The 103 women in the sample were compared to the 124 non-participants. A chi-squared test and an analysis of variance were performed for sociodemographic, disease/treatment, and group intervention variables.

Correlational relationships were examined between the independent variables of sociodemographic variables, disease/treatment variables, and the predictor variables, and the three main dependent outcome variables of the models: spiritual meaning at 24 months follow-up, POMS TMD at 36 months follow-up, and CES-D at 36 months follow-up. Repeated measures analyses of variance were performed for POMS TMD and CES-D, paired between initial and 36 months follow-up, for significant differences.

Hierarchical multiple regression (HMR) analyses were used to perform tests required for establishing mediation for each of the 17 statistical models (Baron & Kenny, 1986; MacKinnon & Dwyer, 1993). Three regression tests were needed for testing mediation: first, regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and the mediator (Baron & Kenny, 1986). If significant results ($p < .05$) were found for all of the three regressions tests in a model, then mediation would be suggested for the model (Baron & Kenny, 1986). This indicated that the significant relationship between the predictor and the outcome was due to their relationship with a third variable, the mediator. The Sobel test statistic (Sobel, 1982) would then be used to evaluate the statistical magnitude and significance of the reduction in variance resulting from the inclusion of the mediator, i.e. the indirect effects

of the predictor on the outcome through the mediator, based on the values from the HMR analyses (MacKinnon & Dwyer, 1993; Preacher & Leonardelli, 2001).

Results

A comparison was made between the 103 women in the sample to the 124 women in the larger study who were not eligible for this specific study. A chi-squared test was conducted for categorical variables: hormone receptors, menopause status, support status, pre-surgery chemotherapy, radiation treatment, race, type of surgery, and stage. There was a significant difference found between the two groups for menopause status ($\chi^2_{(1)} = 5.341, p < .05$), with more women who were pre/peri menopausal in the 103 women sample; and radiation treatment, with more women who were receiving this treatment ($\chi^2_{(1)} = 10.638, p < .05$) in the 103 women sample.

A chi-squared test was performed for group intervention as well, which was not significant ($\chi^2_{(1)} = .115, p > .05$). Therefore, group intervention was not controlled in subsequent analyses. An analysis of variance (ANOVA) test was conducted for continuous variables, including: education, age, and family income. There was a significant difference for education ($F_{(1, 225)} = 4.840, p < .05$); however, this should not greatly affect results as the difference was one year of undergraduate education with a mean of 3 years of college for the 103 women in the sample and 2 years of college for the 124 women not included.

Descriptive statistics of sociodemographic and disease variables are presented in Table 1. In general, the sample was Caucasian (92.2%), partnered (72.8%), and employed (71.8%). With regard to disease variables, most of the sample was diagnosed with stage II (90.3%) rather than stage III disease (9.7%), pre- or peri-menopausal (62.1%) rather than post menopausal (37.9%), and had positive (73.8%) rather than negative hormone receptors. Concerning treatment,

approximately half of the sample had a modified radical mastectomy (52%) and the other segmental mastectomy (48%). Additionally, 5.8% had adjuvant radiation treatment alone, 28.2% adjuvant chemotherapy alone, and 60.2% had both.

Correlations of variables with spiritual meaning at 24 months, POMS TMD at 36 months, and CES-D at 36 months were examined prior to the regression analyses (see Table 2). The only sociodemographic variable correlated with any outcome was education with spiritual meaning. None of the disease/treatment variables were correlated with the outcomes; consequently, none were included in the regression analyses.

Regarding predictors, both measures of distress at initial, POMS TMD and CES-D, were significantly associated with spiritual meaning at 24 months (POMS TMD: $r = -.391$, $p < .001$; CES-D: $r = -.412$, $p < .001$) and distress at 36 months (POMS TMD: $r = .454$, $p < .001$; CES-D: $r = .401$, $p < .001$). Two forms of coping were examined in relation to psychological distress and spiritual meaning. Religious coping was not correlated with any of the three outcomes at follow-up. Active-cognitive coping was correlated significantly with spiritual meaning at 24 months ($r = .356$, $p < .001$). Neither POMS TMD nor CES-D at 36 months was correlated with active-cognitive coping.

As positive affect was included as a predictor in Models 2 through 4, its correlational relationships were examined. Positive affect at 18 months was significantly associated with all three outcomes: spiritual meaning at 24 months ($r = .556$, $p < .001$), POMS TMD at 36 months ($r = -.400$, $p < .001$), and CES-D at 36 months ($r = -.409$, $p < .001$).

In Models 1 and 4, spiritual meaning was a predictor of psychological distress. Spiritual meaning at 24 months was negatively correlated with POMS TMD at 36 months ($r = -.455$, $p < .001$) and CES-D at 36 months ($r = -.524$, $p < .001$).

Finally, since there were two measures of psychological distress used, their relationships with each other were examined. A repeated measures analysis of variance was performed for POMS Total Mood Disturbance at initial and at 36 months, as well as for CES-D at initial and at 36 months. Both pairs yielded significant results ($p < .05$), indicating that there was a significant difference between the pairs. Overall, there was a seven-point reduction in the POMS Total Mood Disturbance group means from 45 ($SD = 26.6$) at initial assessment to 38 ($SD = 31.3$); this change was significant (t (102) = 2.243, $p < .05$; Cohen's $d = .24$). Overall, there was a one-point reduction for group means from 5.4 ($SD = 3.3$) to 4.3 ($SD = 4.1$), which yielded a significant change (t (102) = 2.653, $p < .05$; Cohen's $d = .29$). At the initial assessment, 9.7% (10 of 103) of the women scored above the CES-D cutoff, and at follow-up 36 months later, 11.7% (12 of 103) scored at or above the cut-off.

Religious Coping

There were three religious coping models examined. In Models 1a and 1d, two hierarchical multiple regression (HMR) analyses were conducted for spiritual meaning as a mediator between religious coping and psychological distress, with POMS TMD as the outcome in one analysis and CES-D in the other. In Models 2a and 2d, two analyses were conducted for positive affect as the mediator between religious coping and psychological distress, with POMS TMD and CES-D as separate outcomes, respectively. Only one HMR analysis was necessary for Model 3 (Model 3a), where positive affect was tested as a mediator between religious coping and spiritual meaning. Summaries of the HMR analyses can be seen in Tables 3-5.

Models 1a and 1d examined spiritual meaning at 24 months as a mediator between religious coping at 12 months and psychological distress at 36 months. Religious coping was not a significant predictor for spiritual meaning ($\beta = .165$, $p > .05$), or for POMS TMD at 36 months

after controlling for distress at initial (β = -.018, p > .05). Spiritual meaning significantly predicted psychological distress at 36 months for POMS TMD after controlling for distress at initial and religious coping (β = -.346, p < .001). The overall model was statistically significant ($F_{(3, 99)}$ = 12.857, p < .001; see Table 3, Model 1a), accounting for 28.0% of the total variance (total adjusted R^2 = .259). Therefore, spiritual meaning could not be tested as a mediator as not all three regressions yielded statistically significant results. Similar results were generated with CES-D: religious coping was not a significant predictor for CES-D at 36 months after controlling for distress at initial (β = .005, p > .05); however, spiritual meaning was a significant predictor after controlling for religious coping and CES-D at initial (β = -.443, p < .001). The overall model was statistically significant ($F_{(3, 99)}$ = 15.517, p < .001; see Table 3, Model 1d), accounting for 32.0% of the total variance (total adjusted R^2 = .299). However, mediation could not be tested since not all three regressions were statistically significant.

Models 2a and 2d examined positive affect at 18 months as a mediator between religious coping at 12 months and psychological distress at 36 months. Religious coping was not a significant predictor for positive affect (β = .096, p > .05). As noted above, religious coping was not a significant predictor for either variables of psychological distress. Both overall models were significant: the POMS TMD model ($F_{(3, 99)}$ = 10.691, p < .001; see Table 4, Model 2a) accounted for 24.5% of the total variance (total adjusted R^2 = .222), while the CES-D model ($F_{(3, 99)}$ = 9.870, p < .001; see Table 4, Model 2d) accounted for 23.0% of the total variance (total adjusted R^2 = .207). However, mediation could not be tested.

Model 3a examined positive affect at 18 months as a mediator between religious coping at 12 months and spiritual meaning at 24 months. Education was controlled since it was positively correlated with spiritual meaning (r = .218, p < .05). Religious coping was a

significant predictor for spiritual meaning at 24 months after controlling for education ($\beta = .199$, $p < .05$). Religious coping was not a significant predictor for positive affect. Finally, positive affect was a significant predictor for spiritual meaning after controlling for education and religious coping at 12 months ($\beta = .517$, $p < .001$). The overall model was indeed significant ($F_{(3,99)} = 16.789$, $p < .001$; see Table 5, Model 3a), accounting for 33.7% of the total variance (total adjusted $R^2 = .317$), though it was not possible to test for mediation.

In summary, no mediation analysis was conducted with religious coping as a predictor, since religious coping at 12 months was not correlated at a significant level with any of the outcome variables, including spiritual meaning at 24 months, POMS TMD at 36 months, and CES-D at 36 months (see Table 2).

Active-Cognitive Coping

Active-cognitive coping replaced religious coping for the three models. The overall summaries of the HMR analyses are presented in Tables 3-5.

Models 1b and 1e examined spiritual meaning at 24 months as a mediator between active-cognitive coping at 12 months and psychological distress at 36 months. While active-cognitive coping was a significant predictor for spiritual meaning ($\beta = .356$, $p < .001$), coping was not a significant predictor for psychological distress by POMS TMD at 36 months after controlling for distress at initial ($\beta = .009$, $p > .05$). Spiritual meaning was a significant predictor for POMS TMD upon controlling for coping and POMS TMD at initial ($\beta = -.394$, $p < .001$), and the overall model was significant ($F_{(3, 99)} = 13.871$, $p < .001$; see Table 3, Model 1b), accounting for 29.6% of the total variance (total adjusted $R^2 = .275$). Therefore, spiritual meaning could not be tested as a mediator as not all three regressions yielded statistically significant results. Similar results were generated with CES-D: coping was not a significant predictor for at 36 months after

controlling for distress at initial (β = .034, p > .05) and spiritual meaning was a significant predictor after controlling for coping and CES-D at initial (β = -.493, p < .001). The overall model was statistically significant ($F_{(3, 99)}$ = 17.234, p < .001; see Table 3, Model 1e), accounting for 34.3% of the total variance (total adjusted R^2 = .323). Since not all the regressions were statistically significant, mediation could not be tested.

Models 2b and 2e examined positive affect at 18 months as a mediator between active-cognitive coping at 12 months and psychological distress at 36 months. While active-cognitive coping was a significant predictor for positive affect (β = .349, p < .001), coping was still not a significant predictor for psychological distress by POMS TMD at 36 months after controlling for distress at initial (β = .009, p > .05). Positive affect was a significant predictor for POMS TMD upon controlling for active-cognitive coping and POMS TMD at initial (β = -.316, p < .01) and the overall model was statistically significant ($F_{(3, 99)}$ = 11.315, p < .001; see Table 4, Model 2b), accounting for 25.5% of the total variance (total adjusted R^2 = .233). Consequently, spiritual meaning could not be tested as a mediator as not all three regressions yielded statistically significant results. Similar results were generated with CES-D: coping was still not a significant predictor for at 36 months after controlling for distress at initial (β = .034, p > .05) and positive affect was a significant predictor after controlling for coping and CES-D at initial (β = -.333, p < .01). The analysis of variance yielded statistically significant results for the overall model ($F_{(3, 99)}$ = 10.649, p < .001; see Table 4, Model 2e), accounting for 24.4% of the total variance (total adjusted R^2 = .221). Once again, mediation could not be tested for the model.

Model 3b examined positive affect at 18 months as a mediator between active-cognitive coping at 12 months and spiritual meaning at 24 months. Education was controlled, as it was positively correlated with spiritual meaning (r = .218, p < .05). The regression model was

significant ($F_{(3, 99)} = 17.568$, $p < .001$; see Table 5, Model 3b), accounting for 34.7% of the total variance (total adjusted $R^2 = .328$). As noted above, active-cognitive coping was a significant predictor for positive affect ($\beta = .349$, $p < .001$), and spiritual meaning after controlling for education ($\beta = .331$, $p < .01$). Spiritual meaning was not controlled at initial because data was not available. Positive affect was a significant predictor for spiritual meaning after controlling for education and active-cognitive coping ($\beta = .475$, $p < .001$). Since all three regressions were statistically significant, the model could now be tested for mediation. The Sobel test statistic (Sobel, 1982) was then used to evaluate the statistical magnitude and significance of the reduction in variance resulting from the inclusion of the mediator. The Sobel test statistic was significant, indicating an effect of mediation for positive affect between active-cognitive coping and spiritual meaning (Sobel test statistic = 3.083, $p <.001$; see Figure 3). Active-cognitive coping has its impact on bettering spiritual meaning through increased positive affect.

Spiritual Connection

There were three spiritual connection models examined. In Models 1c and 1f, two hierarchical multiple regression (HMR) analyses were conducted for spiritual meaning as a mediator between spiritual connection and psychological distress, with POMS TMD as the outcome in one analysis and CES-D in the other. In Models 2c and 2f, two analyses were conducted for positive affect as the mediator between spiritual connection and psychological distress, with POMS TMD and CES-D as separate outcomes. Only one HMR analysis was necessary for Model 3, where positive affect was tested as a mediator between spiritual connection and spiritual meaning (see Model 3c), since there was only one measure for spiritual meaning. Summaries of the HMR analyses can be seen in Tables 3-5.

Models 1c and 1f examined spiritual meaning at 24 months as a mediator between

spiritual connection at 12 months and psychological distress at 36 months.

Spiritual connection was nearly a significant predictor for spiritual meaning (β = .191, p = .053). It was not a significant predictor for POMS TMD at 36 months after controlling for distress at initial (β = -.084, $p > .05$). Spiritual meaning significantly predicted psychological distress at 36 months for POMS TMD after controlling for distress at initial and spiritual connection (β = -.334, $p < .01$). The overall model was statistically significant ($F_{(3, 99)}$ = 12.889, $p < .001$; see Table 3, Model 1c), accounting for 28.1% of the total variance (total adjusted R^2 = .259). Therefore, spiritual meaning could not be tested as a mediator, as not all three regressions yielded statistically significant results. Similar results were generated with CES-D: spiritual connection was not a significant predictor for CES-D at 36 months after controlling for distress at initial (β = -.090, $p > .05$); however, spiritual meaning was a significant predictor after controlling for CES-D at initial and connection (β = -.427, $p < .001$). The overall model was statistically significant ($F_{(3, 99)}$ = 15.248, $p < .001$; see Table 3, Model 1f), accounting for 31.6% of the total variance (total adjusted R^2 = .295). However, mediation could not be tested since not all three regressions were statistically significant.

Models 2c and 2f examined positive affect at 18 months as a mediator between spiritual connection at 12 months and psychological distress at 36 months. Spiritual connection was a significant predictor for positive affect (β = .203, $p < .05$). As noted above, spiritual connection was not a significant predictor for either variables of psychological distress. Positive affect significantly predicted psychological distress at 36 months for both POMS TMD and CES-D after controlling for distress at initial and spiritual connection (POMS: β = -.267, $p < .01$; CES-D: β = -.282, $p < .01$). Both overall models were significant: the POMS TMD model ($F_{(3, 99)}$ = 10.807, $p < .001$; see Table 4, Model 2c) accounted for 24.7% of the total variance (total

adjusted R^2 = .224), while the CES-D model ($F_{(3, 99)}$ = 9.940, p < .001; see Table 4, Model 2f) accounted for 23.1% of the total variance (total adjusted R^2 = .208). However, mediation could not be tested.

Model 3c examined positive affect at 18 months as a mediator between spiritual connection at 12 months and spiritual meaning at 24 months. Education was controlled since it was positively correlated with spiritual meaning (r = .218, p < .05). Spiritual connection was a significant predictor for spiritual meaning at 24 months after controlling for education (β = .207, p < .05). Spiritual connection was also a significant predictor for positive affect (β = .203, p < .05). Finally, positive affect was a significant predictor for spiritual meaning after controlling for education and spiritual connection at 12 months (β = .513, p < .001). The overall model was significant ($F_{(3,99)}$ = 16.164, p < .001; see Table 5, Model 3c), accounting for 33% of the total variance (total adjusted R^2 = .308). The Sobel test statistic was significant, indicating an effect of mediation for a higher level of positive affect between a higher level of spiritual connection and increased spiritual meaning (Sobel test statistic = 1.962, p <.05; see Figure 4).

Positive Affect

Model 4 examined spiritual meaning at 24 months as a mediator between positive affect at 18 months and psychological distress at 36 months. The regression model was significant for POMS TMD ($F_{(3, 99)}$ = 13.679, p < .001; see Table 6, Model 4a), accounting for 29.3% of the total variance (total adjusted R^2 = .272). Similarly, CES-D yielded significant results ($F_{(3, 99)}$ = 15.795, p < .001; see Table 6, Model 4b), accounting for 32% of the total variance (total adjusted R^2 = .303). Positive affect was a significant predictor for spiritual meaning (β = .556, p < .001). For POMS TMD at 36 months, positive affect was a significant predictor (β = -.274, p < .01) after controlling for distress at initial, and spiritual meaning was a significant predictor after

controlling for distress at initial and positive affect (β = -.271, p < .05). For CES-D at 36 months, both positive affect (β = -.290, p < .01) and spiritual meaning after controlling for distress at initial and positive affect at 18 months (β = -.380, p < .001) tested as significant predictors for psychological distress at 36 months.

Since all the regressions were statistically significant for both models, this allowed for the test of mediation. The Sobel test statistic (Sobel, 1982) was then used to evaluate the statistical magnitude and significance of the reduction in variance resulting from the inclusion of the mediator. The Sobel test statistic was significant for both measures of distress, indicating an effect of mediation for increased spiritual meaning as a mediator between a higher level of positive affect and a lower level of psychological distress (POMS: Sobel test statistic = -2.427, p <.05, see Figure 5; CES-D: Sobel test statistic = -3.240, p <.01, see Figure 6).

Discussion

The models explored in this study are adaptations from the Spiritual Framework of Coping, and incorporate the construct of positive affect in a novel manner. In sum, support for the Spiritual Framework of Coping is demonstrated through mediation analysis. Four models yield significant mediators. First, positive affect is a mediator between active-cognitive coping and spiritual meaning (see Model 3b). Cancer patients who cope through acceptance and positive reframing of the experience later report more spiritual meaning, which is then associated with greater positive affect. Second, positive affect is a mediator between spiritual connection and spiritual meaning (see Model 3c). Cancer patients who connect on a spiritual level with people in their lives also report a higher level of spiritual meaning through greater positive affect. Lastly, spiritual meaning is a mediator between positive affect and psychological distress, for both the POMS TMD (see Model 4a) and CES-D (see Model 4b). Patients who have a high

level of positive affect in their lives later report a reduced level of psychological distress through finding more spiritual meaning in the cancer experience.

Two models suggest that positive affect is a mediator, between increased active-cognitive coping/spiritual connection and greater spiritual meaning. This may indicate that a high level of positive affect is a crucial component to raising spiritual meaning. Interestingly, there is no relationship between active-cognitive coping and spiritual connection ($p = .069$). This suggests that positive affect may be achieved through multiple methods, whether through an active method of coping in a positive manner or connecting with others spiritually.

The models regarding spiritual meaning as a mediator between more positive affect and less psychological distress is consistent with Fredrickson's broaden-and-build theory that explains how positive affect contributes to coping (1998). Patients with more positive affect may broaden their momentary thought-action repertoires and build on their enduring personal resources, such as the ability to find more spiritual meaning in the cancer experience. Consequently, as they engage in this active, dynamic process, psychological distress is ultimately decreased.

Spiritual connections at both initial and 12 months are correlated to positive affect and religious coping. Religious coping is negatively correlated with employment. Active-cognitive coping is correlated to both positive affect and spiritual meaning. Positive affect and spiritual meaning are correlated to education and to each other. Similar to previous research, the current study finds psychological distress to be negatively associated with positive meaning (Nelson et al., 2002) and active-cognitive coping (Fawzy et al., 1990).

Thirteen of the hypothesized statistical models do not yield significant mediators. The primary ones of note are those testing the direct adaptation of the Spiritual Framework of

Coping, where spiritual meaning is a mediator between religious coping and psychological distress (Models 1a and 1d) and between spiritual connection and psychological distress (Models 1c and 1f). These findings are not consistent with previous literature.

Strengths and Limitations of the Study

The current study has several notable strengths. Firstly, there are no studies testing the SFC model. This study tests several pathways in the model, and focuses on five of the seven constructs involved: stressor, coping, connections, meaning-making, and well-being. Outside of spiritual coping, active-cognitive coping was also examined to see how it would vary in its impact from religious coping. Secondly, positive affect has never been examined in the context of the SFC model. This research study begins the exploration of Frederickson's postulate on positive emotions being the active ingredients between religion and well-being (2002). There has also been very little literature relating positive affect and measures of religiosity/spirituality. This study extends the literature to explore this relationship.

Thirdly, while both positive affect and active-cognitive coping have been proposed as potential mediators of religion/spirituality and health (Frederickson, 2002), to our knowledge, this is the first study that has tested both. Mediation models are important in discerning the causal effect of how an independent variable leads to an outcome. With this understanding, medical professionals can maximize treatment benefits by focusing on elevating the level of the mediating variable, to help improve overall outcome of therapy. Lastly, prior spirituality research in cancer patients has been mainly cross-sectional. However, cross-sectional studies only provide a snapshot in time and cannot ascertain the direction of the statistical relationships (Anstey and Hofer, 2004). The current longitudinal study is able to examine directionality.

There are several limitations to note. The measurements of religious/spiritual coping (assessing prayer and seeking God's help) and spiritual connection (assessing religious importance and frequency of attendance) are limited in scope. It is possible that a broader assessment of these concepts may yield significant results when examining the SFC model. Another limitation is the generalizability of the study. Our sample consists of breast cancer patients and is primarily Caucasian, well-educated, and had above-average income. Ethnicity has been cited as an important variable to consider in spirituality, as research has demonstrated that African-Americans place more emphasis on spiritual connections as they find religion more important than Caucasians (Marx, 1969) and attend church more frequently (Nelson & Nelson, 1975). Breast cancer survivors who are African Americans also report that religion is a more positive resource and benefit from it more than Caucasian women (Van Ness et al., 2003). In addition, our study focuses on examining the impact of religion/spirituality on health after women have ended cancer treatments and are reengaging in their lives. While unlikely, examination of the SFC model at other points in the cancer trajectory (i.e. after diagnosis, after recurrence, etc.) may yield different results. Lastly, spiritual meaning is not assessed at diagnosis, and thus cannot be controlled for in Models 3a-c, where spiritual meaning is the outcome.

Clinical Implications

Traditionally, medical professionals have equipped patients with coping skills to aid in their psychological adjustment to a cancer diagnosis. The results of this study suggest that it may be beneficial for health professionals to provide resources that would target an increase in spiritual connections, positive affect, and spiritual meaning as well. Medical professionals may also use these aspects as warning signs for the progress of the patients. That is, if a patient

experiences a loss in spiritual meaning or positive affect, or has difficulty connecting spiritually, physicians and nurses may see an impact on the patient's subsequent quality of life. Medical training institutions may consider integrating a component of training on the provision of spiritual resources for medical professionals, as many patients have reported that they desire to discuss spiritual issues with their doctors (Ehman, Ott, Short, Ciampa, & Hansen-Flaschen, 1999; King & Bushwick, 1994). If this is not possible, medical professionals should encourage patients and family members to contact religious or spiritual personnel.

There are a variety of coping styles, both related and not related to religiosity/spirituality, and this needs to be examined among cancer patients as well. If a patient is engaging in coping through denial and avoidance, a psychologist needs to identify this and urge the patient to cope through a more active, constructive manner. Similarly, if a patient is engaged in a negative spiritual coping pattern, then the patient needs to seek the help of a spiritual professional. Some religious warning signs for ineffective coping that is related to poorer mental health include religious apathy, attributing the event as God's punishment, anger at God, religious doubts, interpersonal religious conflict, and conflict with church dogma (Pargament et al., 2003). While there are no current statistics on the prevalence of spiritual struggle and strain within the cancer population (Cole, 2005), it is suggested that spiritual strain among other distressed populations could be up to 25% (Fitchett, Rybarczyk, MeMarco, & Nicholas, 1999).

Some suggests that spiritual meaninglessness results in an existential vacuum, an existential crisis that is related to failure to relate to God (Kim, 2001). Research on existential psychotherapy has suggested that the individual should transcend himself or herself within the mind, not beyond the mind, to overcome existential vacuum and encounter God in the unconscious. Spiritually and religiously framed cognitive behavioral therapies have been helpful

for people suffering from depression (Cole, 2005; Propst, Ostrom, Dean, Watkins, & Mashburn, 1992). Research on spiritually-focused therapy has also suggested that a spiritual connection with the transcendent may act as a buffer against pain experiences (Cole, 2005), which may be applicable to the cancer population. An intervention that addresses existential concerns within the patient's spiritual framework, improves spiritual coping, and resolves spiritual strain would be highly beneficial for patients with a low level of spiritual meaning (Cole, 2005).

It may be much easier to identify a low level of positive affect. While positive affect is not necessarily the opposite of negative affect (Watson, Clark, & Tellegen, 1988), clinical depression is usually a good indication for a lack of positive affect. The upward spiral of well-being that comes with the broaden-and-build theory of positive affect (Fredrickson & Joiner, 2002) opposes the downward spiral and narrow thinking of depressed mood (Seligman, Rashid, & Parks, 2006). Traditionally, psychotherapy has been problem-focused where the emphasis has been on curing troubles and repairing the negatives instead of enhancing human positives (Seligman et al., 2006). Positive psychotherapy takes on a different approach and aims to not only reduce negative symptoms of a psychological illness, but directly builds on positive emotions, character strengths, and meaning, which may also buffer against future reoccurrence of the illness (Seligman et al., 2006). Some preliminary studies on positive psychotherapy has found enhanced happiness, decreased levels of mild-to-moderate levels of depression after one year of follow-up, as well as increased remission from major depression than treatment as usual and treatment as usual plus antidepressant medication (Seligman et al., 2006).

Future Direction

The findings of this study lead to a wide range of possibilities for future research. Models may be re-tested with more comprehensive measures that better examine the constructs

of religious coping and spiritual connection. It may be beneficial to try different time points to see if results fluctuate by the context of varying stages of recovery after a cancer diagnosis, such as when the stressor is higher at the time of cancer diagnosis. Other analytic strategies may be employed to examine more than one mediator at a time. It may also be interesting to employ intervention of existential psychotherapy or positive psychotherapy to observe its effects on cancer patients.

Conclusion

This study provides a better understanding of how these rarely examined factors—religious coping, spiritual connections, positive affect, and spiritual meaning—play a role in reducing psychological distress among the cancer population. Thus, medical researchers and professionals should seek to develop treatment that would maximize these constructs. With such treatments, cancer patients would be able to approach the cancer experience in a new way that may allow them to gain benefits from the illness as they could not have previously.

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Table 1

Sociodemographic and Disease Variables of 103 Women in Sample

Variable	Mean (*SD*)		%
Age (in Years)	50.6.(10.3)		
Education (in Years)	15.2 (2.6)		
Family Income (in Thousands)	75.1 (83.0)		
Race		Caucasian/White	92.2%
		African American/Black	7.8%
Support Status		Single	27.2%
		Partnered	72.8%
Employment		No	28.2%
		Yes	71.8%
Stage		II	90.3%
		III	9.7%
Menopause Status		Pre/Peri	62.1%
		Post	37.9%
Hormone Receptors		Negative	26.2%
		Positive	73.8%
Type of Surgery		Lumpectomy	48.5%
		Mastectomy	51.4%
Pre-Surgery Chemotherapy		No	98.1%
		Yes	1.9%
Radiation Treatment		No	34.0%
		Yes	66.0%

Table 2

Correlations between Predictor Variables and Outcome Variables

Variable	Spiritual Meaning at 24 Months	POMS TMD at 36 Months	CES-D at 36 Months
Sociodemographics			
Age	.030	-.165	-.126
Education	.218*	.113	-.041
Family Income	.089	.103	-.115
Race	.039	.019	.077
Support Status	.166	-.082	-.133
Employment	.136	-.042	-.125
Disease/Treatment			
Stage	.038	.017	.059
Menopause Status	.018	-.135	-.090
Hormone Receptors	.121	.387	-.136
Type of Surgery	-.135	.165	.102
Pre-Surgery	-.085	.022	.024
Chemotherapy			
Radiation	.020	-.039	-.034
Distress at Initial			
POMS TMD	-.391***	.426***	.454***
CES-D	-.412***	.335**	.401***
Coping			
Religion	.165	-.038	-.018
at 12 Months			
Active-Cognitive	.356***	-.022	-.037
at 12 Months			

Variable	Spiritual Meaning at 24 Months	POMS TMD at 36 Months	CES-D at 36 Months
Connection			
Religious Connection	.191	-.151	-.131
Affect			
POMS Vigor at 18 Months	.556***	-.400***	-.409***
Meaning			
Spiritual Meaning at 24 Months	1	-.455***	-.524***
Distress at 36 Months			
POMS TMD	-.455***	1	.846***
CES-D	-.524***	.846***	1

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3

Hierarchical Multiple Regressions of Spiritual Meaning as Mediator between Coping/Connection and Distress

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 1a				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Spiritual Meaning Mediates Religious Coping and Distress				
1. Distress at Initial	.181	.181***	.425	4.691***
2. Religious Coping	.182	.000	-.018	-.197
Outcome: Spiritual Meaning ($N = 103$)				
1. Religious Coping	.027	.027	.165	1.677
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.292	3.156**
2. Religious Coping	.182	.000	.033	.377
3. Spiritual Meaning	.280	.099***	-.346	-3.686***
Model 1b				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Spiritual Meaning Mediates Active-Cognitive Coping and Distress				
1. Distress at Initial	.181	.181***	.426	4.700***
2. Active-Cognitive Coping	.181	.000	.009	.095
Outcome: Spiritual Meaning ($N = 103$)				
1. Active-Cognitive Coping	.127	.127**	.356	3.832***
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.282	3.071**
2. Active-Cognitive Coping	.181	.000	.138	1.528
3. Spiritual Meaning	.296	.115***	-.394	-4.014***

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 1c				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Spiritual Meaning Mediates Spiritual Connection and Distress				
1. Distress at Initial	.181	.181***	.412	4.514***
2. Spiritual Connection	.188	.007	-.084	-.921
Outcome: Spiritual Meaning ($N = 103$)				
1. Spiritual Connection	.037	.037	.191	1.957
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.289	3.105**
2. Spiritual connection	.188	.007	-.040	-.461
3. Spiritual Meaning	.281	.093**	-.334	-3.573**
Model 1d				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Religious Coping and Distress				
1. Distress at Initial	.161	.161***	.401	4.372***
2. Religious Coping	.161	.00	.005	.056
Outcome: Spiritual Meaning ($N = 103$)				
1. Religious Coping	.027	.027	.165	1.677
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.222	2.443*
2. Religious Coping	.161	.000	.068	.805
3. Spiritual Meaning	.320	.159***	-.443	-4.812***

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 1e				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Active-Cognitive Coping and Distress				
1. Distress at Initial	.161	.161***	.407	4.375***
2. Active-Cognitive Coping	.162	.001	.034	.363
Outcome: Spiritual Meaning ($N = 103$)				
1. Active-Cognitive Coping	.127	.127**	.356	3.832***
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.229	2.560*
2. Active-Cognitive Coping	.162	.001	.178	2.043*
3. Spiritual Meaning	.343	.181***	-.493	-5.226***
Model 1f				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Spiritual Connection and Distress				
1. Distress at Initial	.161	.161***	.391	4.267***
2. Spiritual Connection	.169	.008	-.090	-.976
Outcome: Spiritual Meaning ($N = 103$)				
1. Spiritual Connection	.037	.037	.191	1.957
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.222	2.434*
2. Spiritual Connection	.169	.008	-.026	-.307
3. Spiritual Meaning	.316	.147***	-.427	-4.619***

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4

Hierarchical Multiple Regressions of Positive Affect as Mediator between Coping/Connection and Distress

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 2a				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Positive Affect Mediates Religious Coping and Distress				
1. Distress at Initial	.181	.181***	.425	4.691***
2. Religious Coping	.182	.000	-.018	-.197
Outcome: Positive Affect ($N = 103$)				
1. Religious Coping	.009	.009	.096	.972
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.317	3.335**
2. Religious Coping	.182	.000	.003	.038
3. Positive Affect	.245	.063**	-.275	-2.876**
Model 2b				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Positive Affect Mediates Active-Cognitive Coping and Distress				
1. Distress at Initial	.181	.181***	.426	4.700***
2. Active-Cognitive Coping	.181	.000	.009	.095
Outcome: Positive Affect ($N = 103$)				
1. Active-Cognitive Coping	.122	.122***	.349	3.747***
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.181	.181***	.309	3.258**
2. Active-Cognitive Coping	.181	.000	.110	1.190
3. Positive Affect	.255	.074**	-.316	-3.136**

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 2c				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Positive Affect Mediates Spiritual Connection and Distress				
1. Distress at Initial	.181	.181***	.412	4.514***
2. Spiritual Connection	.188	.007	-.084	-.921
Outcome: Positive Affect ($N = 103$)				
1. Spiritual Connection	.041	.041*	.203	2.081*
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.313	3.279**
2. Spiritual Connection	.188	.007	-.046	-.515
3. Positive Affect	.247	.059**	-.267	-2.774**
Model 2d				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Religious Coping and Distress				
1. Distress at Initial	.161	.161***	.401	4.372***
2. Religious Coping	.161	.000	.005	.056
Outcome: Positive Affect ($N = 103$)				
1. Religious Coping	.009	.009	.096	.972
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.277	2.843**
2. Religious Coping	.161	.000	.026	.294
3. Positive Affect	.230	.069**	-.292	-2.989**

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 2e				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Active-Cognitive Coping and Distress				
1. Distress at Initial	.161	.161***	.407	4.375***
2. Active-Cognitive Coping	.162	.001	.034	.363
Outcome: Positive Affect ($N = 103$)				
2. Active-Cognitive Coping	.122	.122***	.349	3.747***
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.281	2.904**
2. Active-Cognitive Coping	.162	.001	.128	1.374
3. Positive Affect	.244	.082**	-.333	-3.280**
Model 2f				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Spiritual Connection and Distress				
1. Distress at Initial	.161	.161***	.391	4.267***
2. Spiritual Connection	.169	.008	-.090	-.976
Outcome: Positive Affect ($N = 103$)				
1. Spiritual Connection	.041	.041*	.203	2.081*
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.276	2.828**
2. Spiritual Connection	.169	.008	-.045	-.497
3. Positive Affect	.231	.063**	-.282	-2.845**

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5

Hierarchical Multiple Regressions of Positive Affect as Mediator between Coping/Connection and Spiritual Meaning

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 3a				
Outcome: Spiritual Meaning (N = 103)				
Positive Affect Mediates Religious Coping and Spiritual Meaning				
1. Education	.047	.047*	.245	2.539*
2. Religious Coping	.086	.039*	.199	2.057*
Outcome: Positive Affect (N = 103)				
1. Religious Coping	.009	.009	.096	.972
Outcome: Spiritual Meaning (N = 103)				
1. Education	.047	.047*	.128	1.515
2. Religious Coping	.086	.039*	.133	1.592
3. Positive Affect	.337	.251***	.517	6.125***
Model 3b				
Outcome: Spiritual Meaning (N = 103)				
Positive Affect Mediates Active-Cognitive Coping and Spiritual Meaning				
1. Education	.047	.047*	.169	1.814
2. Active-Cognitive Coping	.155	.107**	.331	3.565**
Outcome: Positive Affect (N = 103)				
1. Active-Cognitive Coping	.122	.122***	.349	3.747***
Outcome: Spiritual Meaning (N = 103)				
1. Education	.047	.047*	.093	1.112
2. Active-Cognitive Coping	.155	.107**	.177	2.031*
3. Positive Affect	.347	.193***	.475	5.406***

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 3c				
Outcome: Spiritual Meaning (N = 103)				
Positive Affect Mediates Spiritual Connection and Spiritual Meaning				
1. Education	.047	.047*	.231	2.419*
2. Spiritual Connection	.090	.042*	.207	2.160*
Outcome: Positive Affect (N = 103)				
1. Spiritual Connection	.041	.041*	.203	2.081*
Outcome: Spiritual Meaning (N = 103)				
1. Education	.047	.047*	.117	1.383
2. Spiritual Connection	.090	.042*	.095	1.122
3. Positive Affect	.329	.239***	.513	5.937***

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 6

Hierarchical Multiple Regressions of Spiritual Meaning as Mediator between Positive Affect and Distress

Step and Predictor	Statistics by Step		Statistics by Predictor	
	TR^2	R^2 Change	β	t
Model 4a				
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
Spiritual Meaning Mediates Positive Affect and Distress				
1. Distress at Initial	.181	.181***	.317	3.351**
2. Positive Affect	.245	.063**	-.274	-2.897**
Outcome: Spiritual Meaning ($N = 103$)				
1. Positive Affect	.309	.309***	.556	6.727***
Outcome: Distress at 36 months (POMS Total Mood Disturbance; $N = 103$)				
1. Distress at Initial	.181	.181***	.262	2.779**
2. Positive Affect	.245	.063**	-.145	-1.386
3. Spiritual Meaning	.293	.048*	-.271	-2.602*
Model 4b				
Outcome: Distress at 36 months (CES-D; $N = 103$)				
Spiritual Meaning Mediates Positive Affect and Distress				
1. Distress at Initial	.161	.161***	.277	2.851**
2. Positive Affect	.230	.069**	-.290	-2.989**
Outcome: Spiritual Meaning ($N = 103$)				
1. Positive Affect	.309	.309***	.556	6.727***
Outcome: Distress at 36 months (CES-D; $N = 103$)				
1. Distress at Initial	.161	.161***	.196	2.084*
2. Positive Affect	.230	.069**	-.114	-1.103
3. Spiritual Meaning	.324	.094***	-.380	-3.712***

* $p < .05$ ** $p < .01$ *** $p < .001$

Figure Captions

Figure 1. Spiritual framework of coping (Gall et al., 2005), a framework which examines pathways of spiritual coping variables that lead to higher well-being.

Figure 2. The four general models examined in this study.

Figure 3. Model 3b: Positive affect at 18 months as a mediator between active-cognitive coping at 12 months and meaning at 24 months.

Figure 4. Model 3c: Positive affect at 18 months as a mediator between spiritual connection at 12 months and meaning at 24 months.

Figure 5. Model 4a: Spiritual meaning at 24 months as a mediator between positive affect at 18 months and distress (POMS TMD) at 36 months.

Figure 6. Model 4b: Spiritual meaning at 24 months as a mediator between positive affect at 18 months and distress (CES-D) at 36 months.

Figure 1.

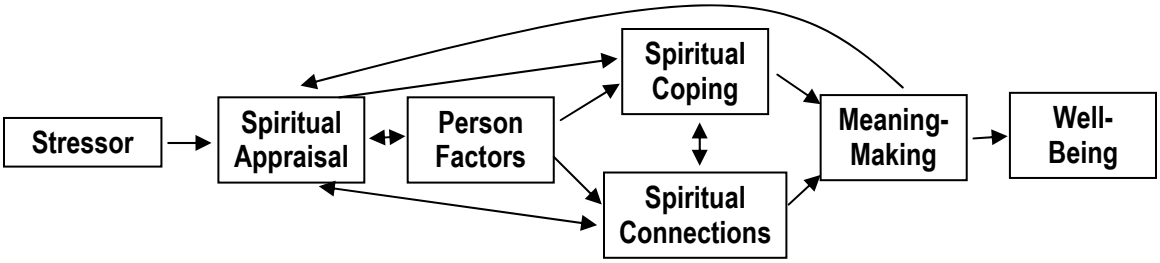
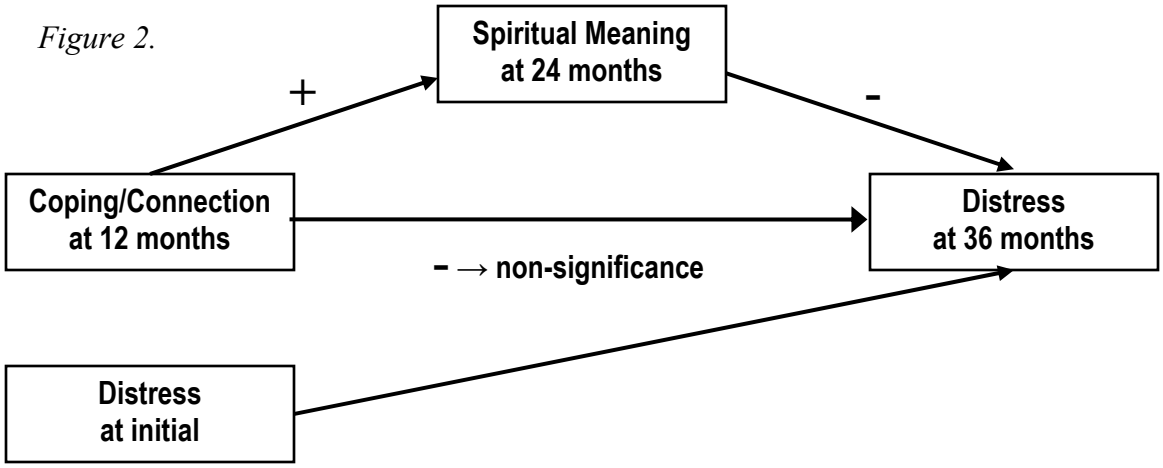
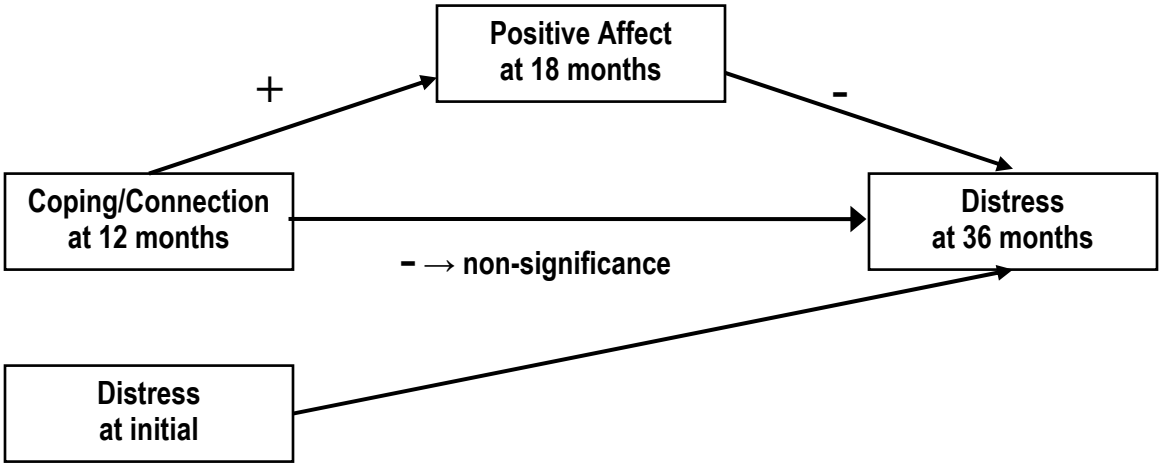

Stressor
Spiritual Appraisal
Person Factors
Spiritual Coping
Spiritual Connections
Meaning-Making
Well-Being

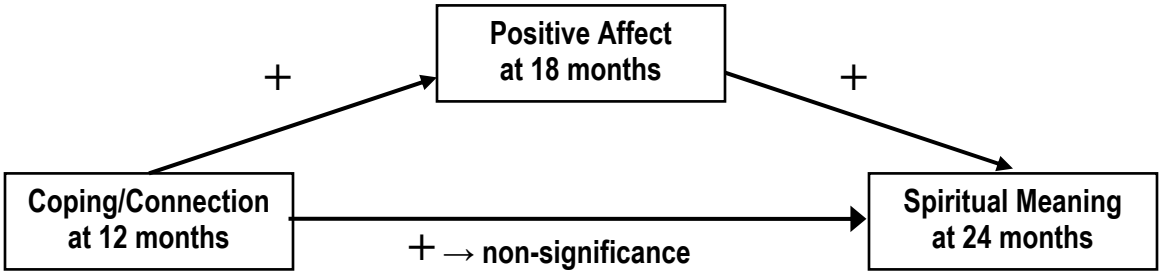
Figure 2.



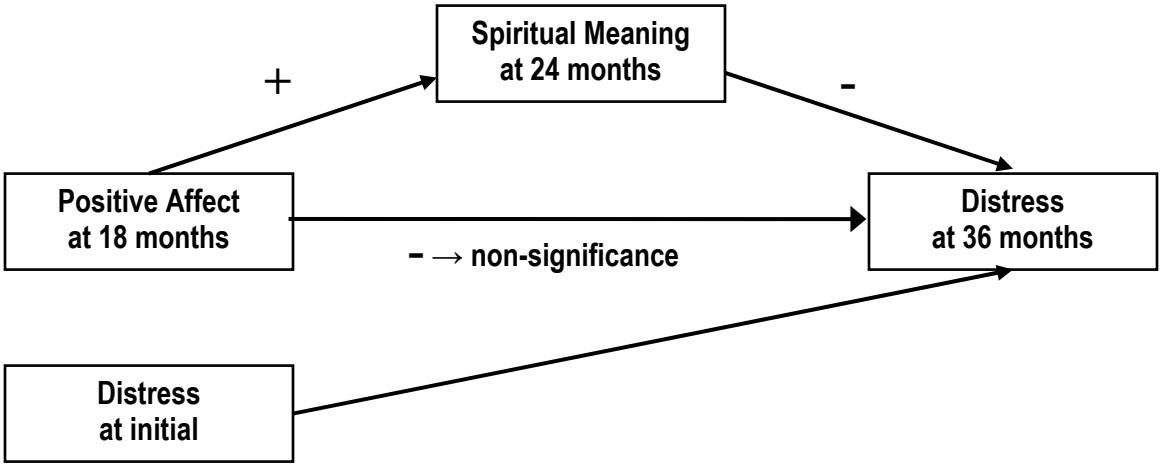
Model 1: Spiritual meaning as a mediator between coping/connection and distress.



Model 2: Positive affect as a mediator between coping/connection and distress.



Model 3: Positive affect as a mediator between coping/connection and spiritual meaning.



Model 4: Spiritual meaning as a mediator between positive affect and distress.

Figure 3.

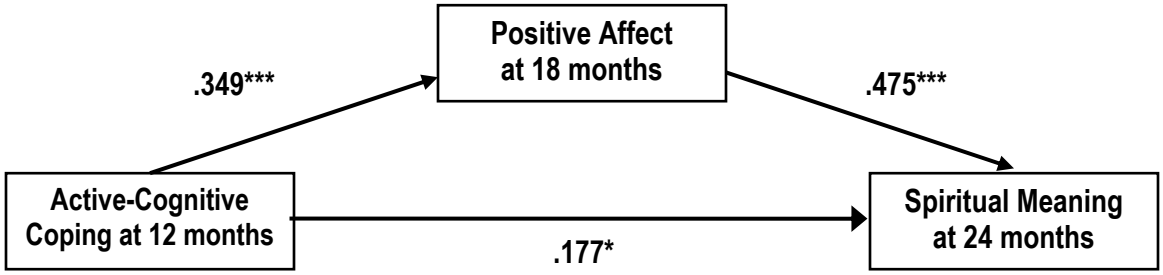

Positive Affect
at 18 months
.349***
.475***
Active-Cognitive
Coping at 12 months
Spiritual Meaning
at 24 months
.177*

Figure 4.

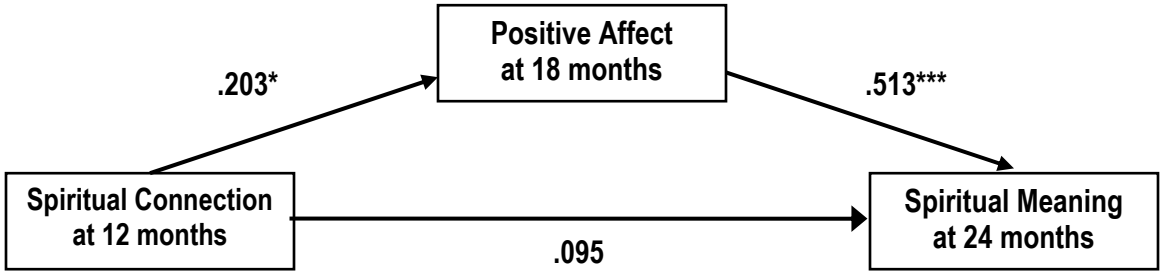

Positive Affect
at 18 months
.203*
.513***
Spiritual Connection
at 12 months
Spiritual Meaning
at 24 months
.095

Figure 5.

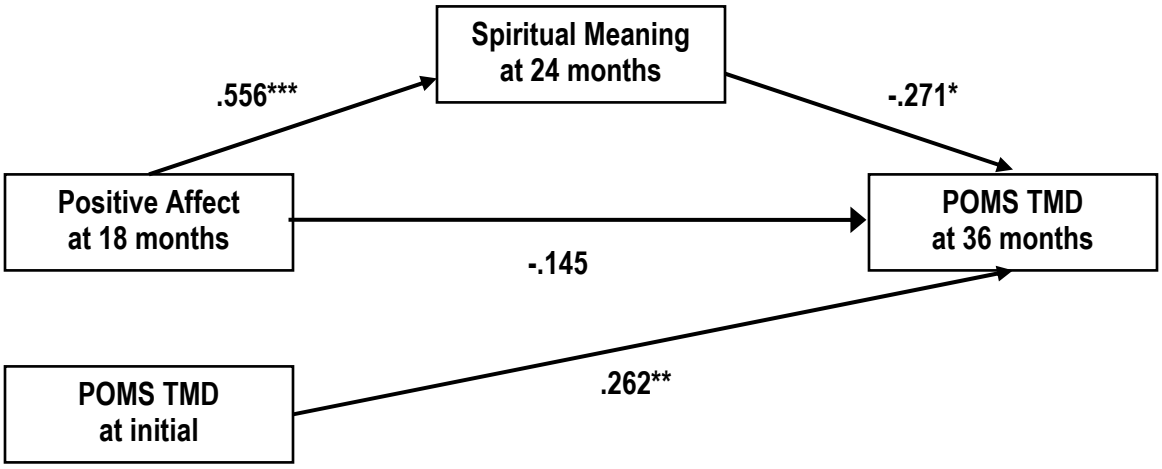
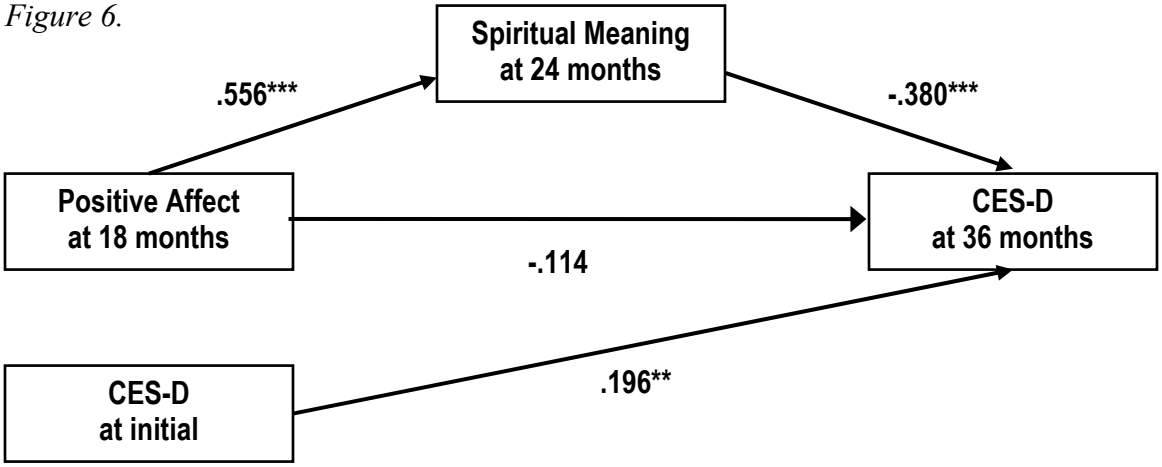

Spiritual Meaning
at 24 months
.556***
-.271*
Positive Affect
at 18 months
POMS TMD
at 36 months
-.145
POMS TMD
at initial
.262**

Figure 6.


Spiritual Meaning
at 24 months
.556***
-.380***
Positive Affect
at 18 months
CES-D
at 36 months
-.114
CES-D
at initial
.196**